COMMONLY USED RESIDENTIAL BUILDING CODES

INTERNATIONAL RESIDENTIAL CODE (2009)

form revised 5/10

WALL FRAMING

23. DESIGN AND CONSTRUCTION. Section R602.3 IRC 2009

Exterior walls of wood-frame construction shall be designed and constructed in accordance with the provisions of this chapter and Figures R602.3(1) and R602.3.(2) or in accordance with AF&PA's NDS. Components of exterior walls shall be fastened in accordance with Tables R602.3(1) through R602.3(4). Structural wall sheathing shall be fastened directly to structural framing members. Exterior wall coverings shall be capable of resisting the wind pressures listed in Table R301.2(2) adjusted for height and exposure using Table R301.2(3). Wood structural panel sheathing used for exterior walls shall conform to the requirements of Table R602.3(3). Studs shall be continuous from support at the sole plate to a support at the top plate to resist loads perpendicular to the wall.

The support shall be a foundation or floor, ceiling or roof diaphragm or shall be designed in accordance with accepted engineering practice.

Exception: Jack studs, trimmer studs and cripple studs at openings in walls that comply with Tables R502.5(1) and R502.5(2).

24. FASTENER SCHEDULE. Tables R602.3(1) - R602.3(4) IRC 2009

Components of exterior walls shall be fastened in accordance with Tables R602.3(1) through R602.3(4).

25. WALL SHEATHING. Section R602.3, Tables R301.2(2), R301.2(3), R602.3(3) IRC 2009

Structural wall sheathing shall be fastened directly to structural framing members. Exterior wall coverings shall be capable of resisting the wind pressures listed in Table R301.2(2) adjusted for height and exposure using Table R301.2(3). Wood structural panel sheathing used for exterior walls shall conform to the requirements of Table R602.3(3).

26. BRACED WALL LINES. Section R602.10.1 IRC 2009

R602.10.1 Braced wall lines. *Braced wall lines* shall be provided in accordance with this section. The length of a *braced wall line* shall be measured as the distance between the ends of the wall line. The end of a *braced wall line* shall be considered to be either:

1. The intersection with perpendicular exterior walls or projection thereof,
2. The intersection with perpendicular *braced wall lines*.

The end of the *braced wall line* shall be chosen such that the maximum length results.

R602.10.1.1 Braced wall panels. *Braced wall panels* shall be constructed in accordance with the intermittent bracing methods specified in Section R602.10.2, or the continuous sheathing methods specified in Sections R602.10.4 and R602.10.5. Mixing of bracing method shall be permitted as follows:

1. Mixing bracing methods from *story* to *story* is permitted.
2. Mixing bracing methods from *braced wall line* to *braced wall line* within a *story* is permitted, except that continuous sheathing methods shall conform to the additional requirements of Sections R602.10.4 and R602.10.5.
3. Mixing bracing methods within a *braced wall line* is permitted only in Seismic Design Categories A and B, and detached *dwellings* in Seismic Design Category C. The length of required bracing for the *braced wall line* with mixed sheathing types shall have the higher bracing length requirement, in accordance with Tables R602.10.1.2(1) and R602.10.1.2(2), of all types of bracing used.

R602.10.1.2 Length of bracing. The length of bracing along each *braced wall line* shall be the greater of that required by the design wind speed and *braced wall line* spacing in accordance with Table 602.10.1.2(1) as adjusted by the factors in the footnotes or the Seismic Design Category and *braced wall line* length in accordance with Table R602.10.1.2(2) as adjusted by the factors in Table R602.10.1.2(3). *Braced wall panel* location requirements shall comply with the requirements of Section R602.10.1.4. Only walls that are parallel to the *braced wall line* shall be counted toward the bracing requirement of that line, except angled walls shall be counted in accordance with Section R602.10.1.3. In no case shall the minimum total length of bracing in a *braced*

wall line, after all adjustments have been taken, be less than 48 inches (1219 mm) total.

27. HEADERS AND LINTELS. Section R602.7 IRC 2009.
For header spans see Tables R502.5(1) and R502.5(2).

28. FIRE BLOCKING. Section R602.8 IRC 2009
Fireblocking shall be provided in accordance with Section R302.11.
R302.11 Fireblocking. In combustible construction, fireblocking shall be provided to cut off all concealed draft openings (both vertical and horizontal) and to form an effective fire barrier between stories, and between a top *story* and the roof space.

Fireblocking shall be provided in wood-frame construction in the following locations:

1. In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs, as follows:
    1.1. Vertically at the ceiling and floor levels.
    1.2. Horizontally at intervals not exceeding 10 feet (3048 mm).
2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.
3. In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section R302.7.
4. At openings around vents, pipes, ducts, cables and wires at ceiling and floor level, with an *approved* material to resist the free passage of flame and products of combustion. The material filling this annular space shall not be required to meet the ASTM E 136 requirements.
5. For the fireblocking of chimneys and fireplaces, see Section R1003.19.
6. Fireblocking of cornices of a two-family *dwelling* is required at the line of *dwelling unit* separation.

R302.11.1 Fireblocking materials. Except as provided in Section R302.11, Item 4, fireblocking shall consist of the following materials.

1. Two-inch (51 mm) nominal lumber.
2. Two thicknesses of 1-inch (25.4 mm) nominal lumber with broken lap joints.
3. One thickness of 23/32-inch (18.3 mm) wood structural panels with joints backed by 23/32-inch (18.3 mm) wood structural panels.
4. One thickness of 3/4-inch (19.1mm)particleboard with joints backed by 3/4-inch (19.1 mm) particleboard.
5. One-half-inch (12.7 mm) gypsum board.
6. One-quarter-inch (6.4 mm) cement-based millboard.
7. Batts or blankets of mineral wool or glass fiber or other *approved* materials installed in such a manner as to be securely retained in place.

R302.11.1.2 Unfaced fiberglass. Unfaced fiberglass batt insulation used as fireblocking shall fill the entire cross section of the wall cavity to a minimum height of 16 inches (406 mm) measured vertically. When piping, conduit or similar obstructions are encountered, the insulation shall be packed tightly around the obstruction.
R302.12 Draftstopping. In combustible construction where there is usable space both above and below the concealed space of a floor/ceiling assembly, draftstops shall be installed so that the area of the concealed space does not exceed 1,000 square feet (92.9 m2). Draftstopping shall divide the concealed space into approximately equal areas. Where the assembly is enclosed by a floor membrane above and a ceiling membrane below, draftstopping shall be provided in floor/ceiling assemblies under the following circumstances:

1. Ceiling is suspended under the floor framing.
2. Floor framing is constructed of truss-type open-web or perforated members.

R302.12.1 Materials. Draftstopping materials shall not be less than 1/2-inch (12.7 mm) gypsum board, 3/8-inch (9.5 mm) wood structural panels or other *approved* materials adequately supported. Draftopping shall be installed parallel to the floor framing members unless otherwise *approved* by the *building official*. The integrity of the draftstops shall be maintained.

29. ALLOWABLE CEILING JOIST SPANS. Section R802.4 IRC 2009

Spans for ceiling joists shall be in accordance with Tables R802.4(1) and R802.4(2). For other grades and species and for other loading conditions, refer to the AF&PA Span Tables for Joists and Rafters.

CORRIDORS

43. WIDTH. Section R311.6 IRC 2009

R311.6 Hallways. The minimum width of a hallway shall be not less than 3 feet (914 mm).

44. HEIGHT. Section R305.1 IRC 2009

R305.1 Minimum height. *Habitable space*, hallways, bathrooms, toilet rooms, laundry rooms and portions of *basements* containing these spaces shall have a ceiling height of not less than 7 feet (2134 mm).

Exceptions:

1. For rooms with sloped ceilings, at least 50 percent of the required floor area of the room must have a ceiling height of at least 7 feet (2134 mm) and no portion of the required floor area may have a ceiling height of less than 5 feet (1524 mm).
2. Bathrooms shall have a minimum ceiling height of 6 feet 8 inches (2032 mm) at the center of the front clearance area for fixtures as shown in Figure R307.1. The ceiling height above fixtures shall be such that the fixture is capable of being used for its intended purpose. A shower or tub equipped with a showerhead shall have a minimum ceiling height of 6 feet 8 inches (2032 mm) above a minimum area 30 inches (762 mm) by 30 inches (762 mm) at the showerhead.

ROOM DIMENSIONS

45. FLOOR AREA. Section R304 IRC 2009

R304.1 Minimum area. Every dwelling unit shall have at least one habitable room that shall have not less than 120 square feet (11.2 m2) of gross floor area.

R304.2 Other rooms. Other habitable rooms shall have a floor area of not less than 70 square feet (6.5 m2).

Exception: Kitchen.

R304.3 Minimum dimensions. Habitable rooms shall not be less than 7 feet (2134 mm) in any horizontal dimension.

Exception: Kitchens.

R304.4 Height effect on room area. Portions of a room with a sloping ceiling measuring less than 5 feet (1524mm) or a furred ceiling measuring less than 7 feet (2134 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required habitable area for that room.

TABLE R502.5(2)
GIRDER SPANS[a] AND HEADER SPANS[a] FOR INTERIOR BEARING WALLS
(Maximum header spans for douglas fir-larch, hem-fir, southern pine and spruce-pine-fir[b] and required number of jack studs)

HEADERS AND GIRDERS SUPPORTING	SIZE	BUILDING WIDTH[c] (feet)					
		20		28		36	
		Span	NJ[d]	Span	NJ[d]	Span	NJ[d]
One floor only	2-2×4	3-1	1	2-8	1	2-5	1
	2-2×6	4-6	1	3-11	1	3-6	1
	2-2×8	5-9	1	5-0	2	4-5	2
	2-2×10	7-0	2	6-1	2	5-5	2
	2-2×12	8-1	2	7-0	2	6-3	2
	3-2×8	7-2	1	6-3	1	5-7	2
	3-2×10	8-9	1	7-7	2	6-9	2
	3-2×12	10-2	2	8-10	2	7-10	2
	4-2×8	5-10	1	5-1	2	4-6	2
	4-2×10	10-1	1	8-9	1	7-10	2
	4-2×12	11-9	1	10-2	2	9-1	2
Two floors	2-2×4	2-2	1	1-10	1	1-7	1
	2-2×6	3-2	2	2-9	2	2-5	2
	2-2×8	4-1	2	3-6	2	3-2	2
	2-2×10	4-11	2	4-3	2	3-10	3
	2-2×12	5-9	2	5-0	3	4-5	3
	3-2×8	5-1	2	4-5	2	3-11	2
	3-2×10	6-2	2	5-4	2	4-10	2
	3-2×12	7-2	2	6-3	2	5-7	3
	4-2×8	4-2	2	3-7	2	3-2	2
	4-2×10	7-2	2	6-2	2	5-6	2
	4-2×12	8-4	2	7-2	2	6-5	2

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. Spans are given in feet and inches.

b. Tabulated values assume #2 grade lumber.

c. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.

d. NJ - Number of jack studs required to support each end. Where the number of required jack studs equals one, the headers are permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.

TABLE R502.5(1)
GIRDER SPANS[a] AND HEADER SPANS[a] FOR EXTERIOR BEARING WALLS
(Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir[b] and required number of jack studs)

GIRDERS AND HEADERS SUPPORTING	SIZE	GROUND SNOW LOAD (psf)[e]																	
		30						50						70					
		Building width[c] (feet)																	
		20		28		36		20		28		36		20		28		36	
		Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]
Roof and ceiling	2-2x4	3-6	1	3-2	1	2-10	1	3-2	1	2-9	1	2-6	1	2-10	1	2-6	1	2-3	1
	2-2x6	5-5	1	4-8	1	4-2	1	4-8	1	4-1	1	3-8	2	4-2	1	3-8	2	3-3	2
	2-2x8	6-10	1	5-11	2	5-4	2	5-11	2	5-2	2	4-7	2	5-4	2	4-7	2	4-1	2
	2-2x10	8-5	2	7-3	2	6-6	2	7-3	2	6-3	2	5-7	2	6-6	2	5-7	2	5-0	2
	2-2x12	9-9	2	8-5	2	7-6	2	8-5	2	7-3	2	6-6	2	7-6	2	6-6	2	5-10	3
	3-2x8	8-4	1	7-5	1	6-8	1	7-5	1	6-5	2	5-9	2	6-8	1	5-9	2	5-2	2
	3-2x10	10-6	1	9-1	2	8-2	2	9-1	2	7-10	2	7-0	2	8-2	2	7-0	2	6-4	2
	3-2x12	12-2	2	10-7	2	9-5	2	10-7	2	9-2	2	8-2	2	9-5	2	8-2	2	7-4	2
	4-2x8	9-2	1	8-4	1	7-8	1	8-4	1	7-5	1	6-8	1	7-8	1	6-8	1	5-11	2
	4-2x10	11-8	1	10-6	1	9-5	2	10-6	1	9-1	2	8-2	2	9-5	2	8-2	2	7-3	2
	4-2x12	14-1	1	12-2	2	10-11	2	12-2	2	10-7	2	9-5	2	10-11	2	9-5	2	8-5	2
Roof, ceiling and one center-bearing floor	2-2x4	3-1	1	2-9	1	2-5	1	2-9	1	2-5	1	2-2	1	2-7	1	2-3	1	2-0	1
	2-2x6	4-6	1	4-0	1	3-7	2	4-1	1	3-7	2	3-3	2	3-9	2	3-3	2	2-11	2
	2-2x8	5-9	2	5-0	2	4-6	2	5-2	2	4-6	2	4-1	2	4-9	2	4-2	2	3-9	2
	2-2x10	7-0	2	6-2	2	5-6	2	6-4	2	5-6	2	5-0	2	5-9	2	5-1	2	4-7	3
	2-2x12	8-1	2	7-1	2	6-5	2	7-4	2	6-5	2	5-9	3	6-8	2	5-10	3	5-3	3
	3-2x8	7-2	1	6-3	2	5-8	2	6-5	2	5-8	2	5-1	2	5-11	2	5-2	2	4-8	2
	3-2x10	8-9	2	7-8	2	6-11	2	7-11	2	6-11	2	6-3	2	7-3	2	6-4	2	5-8	2
	3-2x12	10-2	2	8-11	2	8-0	2	9-2	2	8-0	2	7-3	2	8-5	2	7-4	2	6-7	2
	4-2x8	8-1	1	7-3	1	6-7	1	7-5	1	6-6	1	5-11	2	6-10	1	6-0	2	5-5	2
	4-2x10	10-1	1	8-10	2	8-0	2	9-1	2	8-0	2	7-2	2	8-4	2	7-4	2	6-7	2
	4-2x12	11-9	2	10-3	2	9-3	2	10-7	2	9-3	2	8-4	2	9-8	2	8-6	2	7-7	2
Roof, ceiling and one clear span floor	2-2x4	2-8	1	2-4	1	2-1	1	2-7	1	2-3	1	2-0	1	2-5	1	2-1	1	1-10	1
	2-2x6	3-11	1	3-5	2	3-0	2	3-10	2	3-4	2	3-0	2	3-6	2	3-1	2	2-9	2
	2-2x8	5-0	2	4-4	2	3-10	2	4-10	2	4-2	2	3-9	2	4-6	2	3-11	2	3-6	2
	2-2x10	6-1	2	5-3	2	4-8	2	5-11	2	5-1	2	4-7	3	5-6	2	4-9	2	4-3	3
	2-2x12	7-1	2	6-1	3	5-5	3	6-10	2	5-11	3	5-4	3	6-4	2	5-6	3	5-0	3
	3-2x8	6-3	2	5-5	2	4-10	2	6-1	2	5-3	2	4-8	2	5-7	2	4-11	2	4-5	2
	3-2x10	7-7	2	6-7	2	5-11	2	7-5	2	6-5	2	5-9	2	6-10	2	6-0	2	5-4	2
	3-2x12	8-10	2	7-8	2	6-10	2	8-7	2	7-5	2	6-8	2	7-11	2	6-11	2	6-3	2
	4-2x8	7-2	1	6-3	2	5-7	2	7-0	1	6-1	2	5-5	2	6-6	1	5-8	2	5-1	2
	4-2x10	8-9	2	7-7	2	6-10	2	8-7	2	7-5	2	6-7	2	7-11	2	6-11	2	6-2	2
	4-2x12	10-2	2	8-10	2	7-11	2	9-11	2	8-7	2	7-8	2	9-2	2	8-0	2	7-2	2
Roof, ceiling and two center-bearing floors	2-2x4	2-7	1	2-3	1	2-0	1	2-6	1	2-2	1	1-11	1	2-4	1	2-0	1	1-9	1
	2-2x6	3-9	2	3-3	2	2-11	2	3-8	2	3-2	2	2-10	2	3-5	2	3-0	2	2-8	2
	2-2x8	4-9	2	4-2	2	3-9	2	4-7	2	4-0	2	3-8	2	4-4	2	3-9	2	3-5	2
	2-2x10	5-9	2	5-1	2	4-7	3	5-8	2	4-11	2	4-5	3	5-3	2	4-7	3	4-2	3
	2-2x12	6-8	2	5-10	3	5-3	3	6-6	2	5-9	3	5-2	3	6-1	3	5-4	3	4-10	3
	3-2x8	5-11	2	5-2	2	4-8	2	5-9	2	5-1	2	4-7	2	5-5	2	4-9	2	4-3	2
	3-2x10	7-3	2	6-4	2	5-8	2	7-1	2	6-2	2	5-7	2	6-7	2	5-9	2	5-3	2
	3-2x12	8-5	2	7-4	2	6-7	2	8-2	2	7-2	2	6-5	3	7-8	2	6-9	2	6-1	3
	4-2x8	6-10	1	6-0	2	5-5	2	6-8	1	5-10	2	5-3	2	6-3	2	5-6	2	4-11	2
	4-2x10	8-4	2	7-4	2	6-7	2	8-2	2	7-2	2	6-5	2	7-7	2	6-8	2	6-0	2
	4-2x12	9-8	2	8-6	2	7-8	2	9-5	2	8-3	2	7-5	2	8-10	2	7-9	2	7-0	2

(continued)

TABLE R502.5(1)—continued
GIRDER SPANS[a] AND HEADER SPANS[a] FOR EXTERIOR BEARING WALLS
(Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir[b] and required number of jack studs)

GIRDERS AND HEADERS SUPPORTING	SIZE	GROUND SNOW LOAD (psf)[e]																	
		30						50						70					
		Building width[c] (feet)																	
		20		28		36		20		28		36		20		28		36	
		Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]
Roof, ceiling, and two clear span floors	2-2x4	2-1	1	1-8	1	1-6	2	2-0	1	1-8	1	1-5	2	2-0	1	1-8	1	1-5	2
	2-2x6	3-1	2	2-8	2	2-4	2	3-0	2	2-7	2	2-3	2	2-11	2	2-7	2	2-3	2
	2-2x8	3-10	2	3-4	2	3-0	3	3-10	2	3-4	2	2-11	3	3-9	2	3-3	2	2-11	3
	2-2x10	4-9	2	4-1	3	3-8	3	4-8	2	4-0	3	3-7	3	4-7	3	4-0	3	3-6	3
	2-2x12	5-6	3	4-9	3	4-3	3	5-5	3	4-8	3	4-2	3	5-4	3	4-7	3	4-1	4
	3-2x8	4-10	2	4-2	2	3-9	2	4-9	2	4-1	2	3-8	2	4-8	2	4-1	2	3-8	2
	3-2x10	5-11	2	5-1	2	4-7	3	5-10	2	5-0	2	4-6	3	5-9	2	4-11	2	4-5	3
	3-2x12	6-10	2	5-11	3	5-4	3	6-9	2	5-10	3	5-3	3	6-8	2	5-9	3	5-2	3
	4-2x8	5-7	2	4-10	2	4-4	2	5-6	2	4-9	2	4-3	2	5-5	2	4-8	2	4-2	2
	4-2x10	6-10	2	5-11	2	5-3	2	6-9	2	5-10	2	5-2	2	6-7	2	5-9	2	5-1	2
	4-2x12	7-11	2	6-10	2	6-2	3	7-9	2	6-9	2	6-0	3	7-8	2	6-8	2	5-11	3

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa.

a. Spans are given in feet and inches.

b. Tabulated values assume #2 grade lumber.

c. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.

d. NJ - Number of jack studs required to support each end. Where the number of required jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.

e. Use 30 psf ground snow load for cases in which ground snow load is less than 30 psf and the roof live load is equal to or less than 20 psf.

TABLE R502.5(2)
GIRDER SPANS[a] AND HEADER SPANS[a] FOR INTERIOR BEARING WALLS
(Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir[b] and required number of jack studs)

HEADERS AND GIRDERS SUPPORTING	SIZE	BUILDING WIDTH[c] (feet)					
		20		28		36	
		Span	NJ[d]	Span	NJ[d]	Span	NJ[d]
One floor only	2-2×4	3-1	1	2-8	1	2-5	1
	2-2×6	4-6	1	3-11	1	3-6	1
	2-2×8	5-9	1	5-0	2	4-5	2
	2-2×10	7-0	2	6-1	2	5-5	2
	2-2×12	8-1	2	7-0	2	6-3	2
	3-2×8	7-2	1	6-3	1	5-7	2
	3-2×10	8-9	1	7-7	2	6-9	2
	3-2×12	10-2	2	8-10	2	7-10	2
	4-2×8	9-0	1	7-8	1	6-9	1
	4-2×10	10-1	1	8-9	1	7-10	2
	4-2×12	11-9	1	10-2	2	9-1	2
Two floors	2-2×4	2-2	1	1-10	1	1-7	1
	2-2×6	3-2	2	2-9	2	2-5	2
	2-2×8	4-1	2	3-6	2	3-2	2
	2-2×10	4-11	2	4-3	2	3-10	3
	2-2×12	5-9	2	5-0	3	4-5	3
	3-2×8	5-1	2	4-5	2	3-11	2
	3-2×10	6-2	2	5-4	2	4-10	2
	3-2×12	7-2	2	6-3	2	5-7	3
	4-2×8	6-1	1	5-3	2	4-8	2
	4-2×10	7-2	2	6-2	2	5-6	2
	4-2×12	8-4	2	7-2	2	6-5	2

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. Spans are given in feet and inches.

b. Tabulated values assume #2 grade lumber.

c. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.

d. NJ - Number of jack studs required to support each end. Where the number of required jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.

TABLE R602.3(1)
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER[a, b, c]	SPACING OF FASTENERS
	Roof		
1	Blocking between joists or rafters to top plate, toe nail	3-8d ($2^1/_2$" × 0.113")	—
2	Ceiling joists to plate, toe nail	3-8d ($2^1/_2$" × 0.113")	—
3	Ceiling joists not attached to parallel rafter, laps over partitions, face nail	3-10d	—
4	Collar tie rafter, face nail or $1^1/_4$" × 20 gage ridge strap	3-10d (3" × 0.128")	—
5	Rafter to plate, toe nail	2-16d ($3^1/_2$" × 0.135")	—
6	Roof rafters to ridge, valley or hip rafters: toe nail face nail	 4-16d ($3^1/_2$" × 0.135") 3-16d ($3^1/_2$" × 0.135")	 — —
	Wall		
7	Built-up corner studs	10d (3" × 0.128")	24" o.c.
8	Built-up header, two pieces with $^1/_2$" spacer	16d ($3^1/_2$" × 0.135")	16" o.c. along each edge
9	Continued header, two pieces	16d ($3^1/_2$" × 0.135")	16" o.c. along each edge
10	Continuous header to stud, toe nail	4-8d ($2^1/_2$" × 0.113")	—
11	Double studs, face nail	10d (3" × 0.128")	24" o.c.
12	Double top plates, face nail	10d (3" × 0.128")	24" o.c.
13	Double top plates, minimum 48-inch offset of end joints, face nail in lapped area	8-16d ($3^1/_2$" × 0.135")	—
14	Sole plate to joist or blocking, face nail	16d ($3^1/_2$" × 0.135")	16" o.c.
15	Sole plate to joist or blocking at braced wall panels	3-16d ($3^1/_2$" × 0.135")	16" o.c.
16	Stud to sole plate, toe nail	3-8d ($2^1/_2$" × 0.113") or 2-16d $3^1/_2$" × 0.135")	— —
17	Top or sole plate to stud, end nail	2-16d ($3^1/_2$" × 0.135")	—
18	Top plates, laps at corners and intersections, face nail	2-10d (3" × 0.128")	—
19	1" brace to each stud and plate, face nail	2-8d ($2^1/_2$" × 0.113") 2 staples $1^3/_4$"	— —
20	1" × 6" sheathing to each bearing, face nail	2-8d ($2^1/_2$" × 0.113") 2 staples $1^3/_4$"	— —
21	1" × 8" sheathing to each bearing, face nail	2-8d ($2^1/_2$" × 0.113") 3 staples $1^3/_4$"	— —
22	Wider than 1" × 8" sheathing to each bearing, face nail	3-8d ($2^1/_2$" × 0.113") 4 staples $1^3/_4$"	— —
	Floor		
23	Joist to sill or girder, toe nail	3-8d ($2^1/_2$" × 0.113")	—
24	1" × 6" subfloor or less to each joist, face nail	2-8d ($2^1/_2$" × 0.113") 2 staples $1^3/_4$"	— —
25	2" subfloor to joist or girder, blind and face nail	2-16d ($3^1/_2$" × 0.135")	—
26	Rim joist to top plate, toe nail (roof applications also)	8d ($2^1/_2$" × 0.113")	6" o.c.
27	2" planks (plank & beam – floor & roof)	2-16d ($3^1/_2$" × 0.135")	at each bearing
28	Built-up girders and beams, 2-inch lumber layers	10d (3" × 0.128")	Nail each layer as follows: 32" o.c. at top and bottom and staggered. Two nails at ends and at each splice.
29	Ledger strip supporting joists or rafters	3-16d ($3^1/_2$" × 0.135")	At each joist or rafter

(continued)

TABLE R602.3(1)—continued
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING MATERIALS	DESCRIPTION OF FASTENER[b, c, e]	SPACING OF FASTENERS	
			Edges (inches)[i]	Intermediate supports[c, e] (inches)
Wood structural panels, subfloor, roof and interior wall sheathing to framing and particleboard wall sheathing to framing				
30	3/8" - 1/2"	6d common (2" × 0.113") nail (subfloor wall)[j] 8d common (2 1/2" × 0.131") nail (roof)	6	12[g]
31	5/16" - 1/2"	6d common (2" × 0.113") nail (subfloor, wall) 8d common (2 1/2" × 0.131") nail (roof)[f]	6	12[g]
32	19/32" - 1"	8d common nail (2 1/2" × 0.131")	6	12[g]
33	1 1/8" - 1 1/4"	10d common (3" × 0.148") nail or 8d (2 1/2" × 0.131") deformed nail	6	12
Other wall sheathing[h]				
34	1/2" structural cellulosic fiberboard sheathing	1/2" galvanized roofing nail, 7/16" crown or 1" crown staple 16 ga., 1 1/4" long	3	6
35	25/32" structural cellulosic fiberboard sheathing	1 3/4" galvanized roofing nail, 7/16" crown or 1" crown staple 16 ga., 1 1/2" long	3	6
36	1/2" gypsum sheathing[d]	1 1/2" galvanized roofing nail; staple galvanized, 1 1/2" long; 1 1/4 screws, Type W or S	7	7
37	5/8" gypsum sheathing[d]	1 3/4" glavanized roofing nail; staple galvanized, 1 5/8" long; 1 5/8" screws, Type W or S	7	7
Wood structural panels, combination subfloor underlayment to framing				
38	3/4" and less	6d deformed (2" × 0.120") nail or 8d common (2 1/2" × 0.131") nail	6	12
39	7/8" - 1"	8d common (2 1/2" × 0.131") nail or 8d deformed (2 1/2" × 0.120") nail	6	12
40	1 1/8" - 1 1/4"	10d common (3" × 0.148") nail or 8d deformed (2 1/2" × 0.120") nail	6	12

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s; 1ksi = 6.895 MPa.

a. All nails are smooth-common, box or deformed shanks except where otherwise stated. Nails used for framing and sheathing connections shall have minimum average bending yield strengths as shown: 80 ksi for shank diameter of 0.192 inch (20d common nail), 90 ksi for shank diameters larger than 0.142 inch but not larger than 0.177 inch, and 100 ksi for shank diameters of 0.142 inch or less.

b. Staples are 16 gage wire and have a minimum 7/16-inch on diameter crown width.

c. Nails shall be spaced at not more than 6 inches on center at all supports where spans are 48 inches or greater.

d. Four-foot-by-8-foot or 4-foot-by-9-foot panels shall be applied vertically.

e. Spacing of fasteners not included in this table shall be based on Table R602.3(2).

f. For regions having basic wind speed of 110 mph or greater, 8d deformed (2 1/2" × 0.120) nails shall be used for attaching plywood and wood structural panel roof sheathing to framing within minimum 48-inch distance from gable end walls, if mean roof height is more than 25 feet, up to 35 feet maximum.

g. For regions having basic wind speed of 100 mph or less, nails for attaching wood structural panel roof sheathing to gable end wall framing shall be spaced 6 inches on center. When basic wind speed is greater than 100 mph, nails for attaching panel roof sheathing to intermediate supports shall be spaced 6 inches on center for minimum 48-inch distance from ridges, eaves and gable end walls; and 4 inches on center to gable end wall framing.

h. Gypsum sheathing shall conform to ASTM C 1396 and shall be installed in accordance with GA 253. Fiberboard sheathing shall conform to ASTM C 208.

i. Spacing of fasteners on floor sheathing panel edges applies to panel edges supported by framing members and required blocking and at all floor perimeters only. Spacing of fasteners on roof sheathing panel edges applies to panel edges supported by framing members and required blocking. Blocking of roof or floor sheathing panel edges perpendicular to the framing members need not be provided except as required by other provisions of this code. Floor perimeter shall be supported by framing members or solid blocking.

TABLE R602.3(2)
ALTERNATE ATTACHMENTS

NOMINAL MATERIAL THICKNESS (inches)	DESCRIPTION[a, b] OF FASTENER AND LENGTH (inches)	SPACING[c] OF FASTENERS	
		Edges (inches)	Intermediate supports (inches)
Wood structural panels subfloor, roof and wall sheathing to framing and particleboard wall sheathing to framing[f]			
up to 1/2	Staple 15 ga. 1 3/4	4	8
	0.097 - 0.099 Nail 2 1/4	3	6
	Staple 16 ga. 1 3/4	3	6
19/32 and 5/8	0.113 Nail 2	3	6
	Staple 15 and 16 ga. 2	4	8
	0.097 - 0.099 Nail 2 1/4	4	8
23/32 and 3/4	Staple 14 ga. 2	4	8
	Staple 15 ga. 1 3/4	3	6
	0.097 - 0.099 Nail 2 1/4	4	8
	Staple 16 ga. 2	4	8
1	Staple 14 ga. 2 1/4	4	8
	0.113 Nail 2 1/4	3	6
	Staple 15 ga. 2 1/4	4	8
	0.097 - 0.099 Nail 2 1/2	4	8
NOMINAL MATERIAL THICKNESS (inches)	**DESCRIPTION[a,b] OF FASTENER AND LENGTH (inches)**	**SPACING[c] OF FASTENERS**	
		Edges (inches)	**Body of panel[d] (inches)**
Floor underlayment; plywood-hardboard-particleboard[f]			
Plywood			
1/4 and 5/16	1 1/4 ring or screw shank nail—minimum 12 1/2 ga. (0.099") shank diameter	3	6
	Staple 18 ga., 7/8, 3/16 crown width	2	5
11/32, 3/8, 15/32, and 1/2	1 1/4 ring or screw shank nail—minimum 12 1/2 ga. (0.099") shank diameter	6	8[e]
19/32, 5/8, 23/32 and 3/4	1 1/2 ring or screw shank nail—minimum 12 1/2 ga. (0.099") shank diameter	6	8
	Staple 16 ga. 1 1/2	6	8
Hardboard[f]			
0.200	1 1/2 long ring-grooved underlayment nail	6	6
	4d cement-coated sinker nail	6	6
	Staple 18 ga., 7/8 long (plastic coated)	3	6
Particleboard			
1/4	4d ring-grooved underlayment nail	3	6
	Staple 18 ga., 7/8 long, 3/16 crown	3	6
3/8	6d ring-grooved underlayment nail	6	10
	Staple 16 ga., 1 1/8 long, 3/8 crown	3	6
1/2, 5/8	6d ring-grooved underlayment nail	6	10
	Staple 16 ga., 1 5/8 long, 3/8 crown	3	6

For SI: 1 inch = 25.4 mm.

a. Nail is a general description and may be T-head, modified round head or round head.

b. Staples shall have a minimum crown width of 7/16-inch on diameter except as noted.

c. Nails or staples shall be spaced at not more than 6 inches on center at all supports where spans are 48 inches or greater. Nails or staples shall be spaced at not more than 12 inches on center at intermediate supports for floors.

d. Fasteners shall be placed in a grid pattern throughout the body of the panel.

e. For 5-ply panels, intermediate nails shall be spaced not more than 12 inches on center each way.

f. Hardboard underlayment shall conform to ANSI/AHA A135.4.

TABLE R602.3(3)
REQUIREMENTS FOR WOOD STRUCTURAL PANEL WALL SHEATHING USED TO RESIST WIND PRESSURES[a,b,c]

MINIMUM NAIL		MINIMUM WOOD STRUCTURAL PANEL SPAN RATING	MINIMUM NOMINAL PANEL THICKNESS (Inches)	MAXIMUM WALL STUD SPACING (Inches)	PANEL NAIL SPACING		MAXIMUM WIND SPEED (mph)		
							Wind exposure category		
Size	Penetration (Inches)				Edges (Inches o.c.)	Field (Inches o.c.)	B	C	D
6d Common (2.0″ × 0.113″)	1.5	24/0	3/8	16	6	12	110	90	85
8d Common (2.5″ × 0.131″)	1.75	24/16	7/16	16	6	12	130	110	105
				24	6	12	110	90	85

For SI: 1 inch = 25.4 mm, 1 mile per hour = 0.447 m/s.

a. Panel strength axis parallel or perpendicular to supports. Three-ply plywood sheathing with studs spaced more than 16 inches on center shall be applied with panel strength axis perpendicular to supports.

b. Table is based on wind pressures acting toward and away from building surfaces per Section R301.2. Lateral bracing requirements shall be in accordance with Section R602.10.

c. Wood Structural Panels with span ratings of Wall-16 or Wall-24 shall be permitted as an alternate to panels with a 24/0 span rating. Plywood siding rated 16 oc or 24 oc shall be permitted as an alternate to panels with a 24/16 span rating. Wall-16 and Plywood siding 16 oc shall be used with studs spaced a maximum of 16 inches on center.

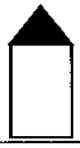
TABLE R602.3(4)
ALLOWABLE SPANS FOR PARTICLEBOARD WALL SHEATHING[a]

THICKNESS (Inch)	GRADE	STUD SPACING (Inches)	
		When siding is nailed to studs	When siding is nailed to sheathing
3/8	M—1 Exterior glue	16	—
1/2	M—2 Exterior glue	16	16

For SI: 1 inch = 25.4 mm.

a. Wall sheathing not exposed to the weather. If the panels are applied horizontally, the end joints of the panel shall be offset so that four panels corners will not meet. All panel edges must be supported. Leave a 1/16-inch gap between panels and nail no closer than 3/8 inch from panel edges.

TABLE R602.3(5)
SIZE, HEIGHT AND SPACING OF WOOD STUDS[a]

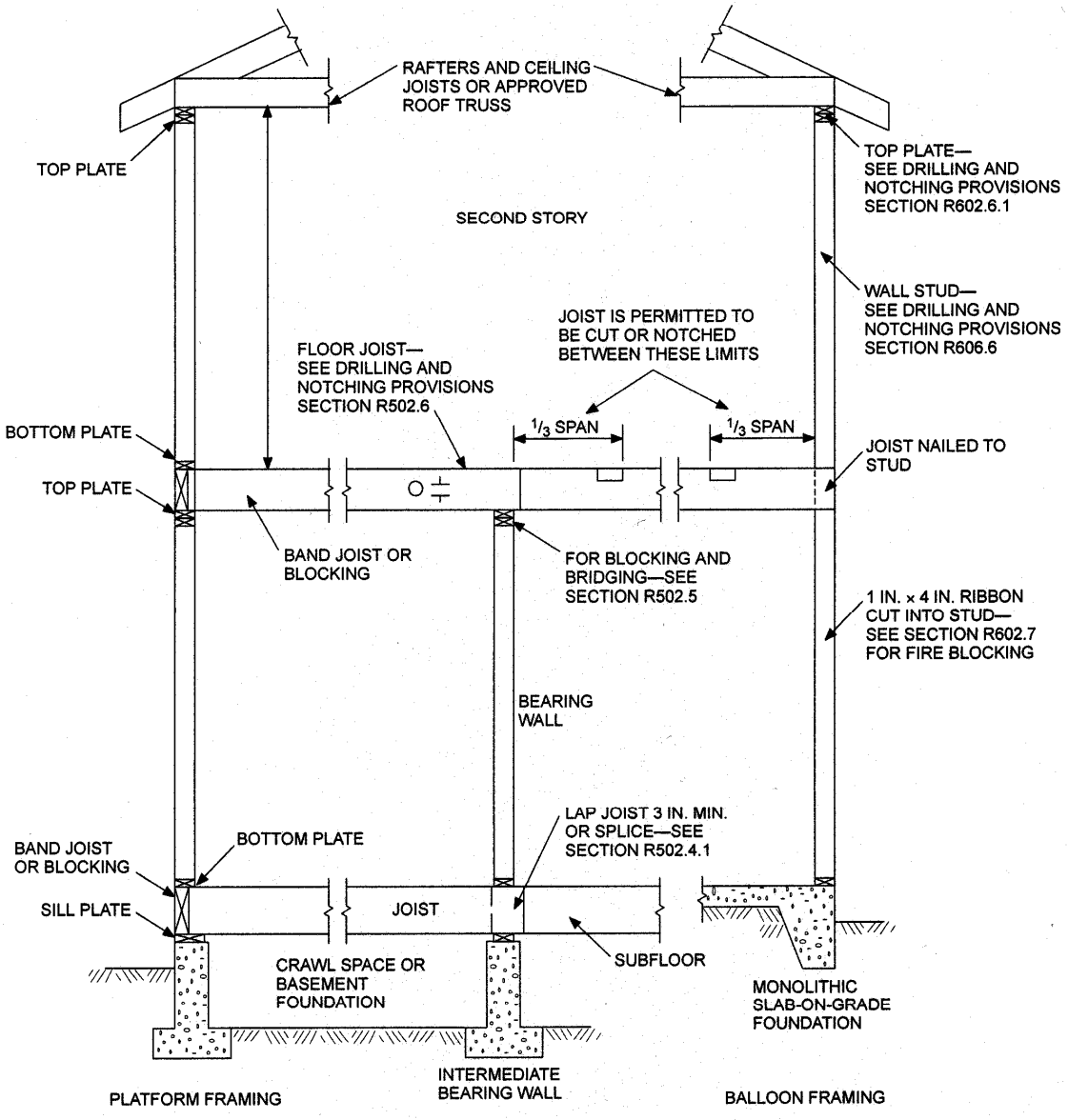
STUD SIZE (Inches)	BEARING WALLS					NONBEARING WALLS	
	Laterally unsupported stud height[a] (feet)	Maximum spacing when supporting a roof-ceiling assembly or a habitable attic assembly, only (Inches)	Maximum spacing when supporting one floor, plus a roof-ceiling assembly or a habitable attic assembly (Inches)	Maximum spacing when supporting two floors, plus a roof-ceiling assembly or a habitable attic assembly (Inches)	Maximum spacing when supporting one floor height[a] (feet)	Laterally unsupported stud height[a] (feet)	Maximum spacing (Inches)
							
2 × 3[b]	—	—	—	—	—	10	16
2 × 4	10	24[c]	16[c]	—	24	14	24
3 × 4	10	24	24	16	24	14	24
2 × 5	10	24	24	—	24	16	24
2 × 6	10	24	24	16	24	20	24

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 square foot = 0.093 m^2.

a. Listed heights are distances between points of lateral support placed perpendicular to the plane of the wall. Increases in unsupported height are permitted where justified by analysis.

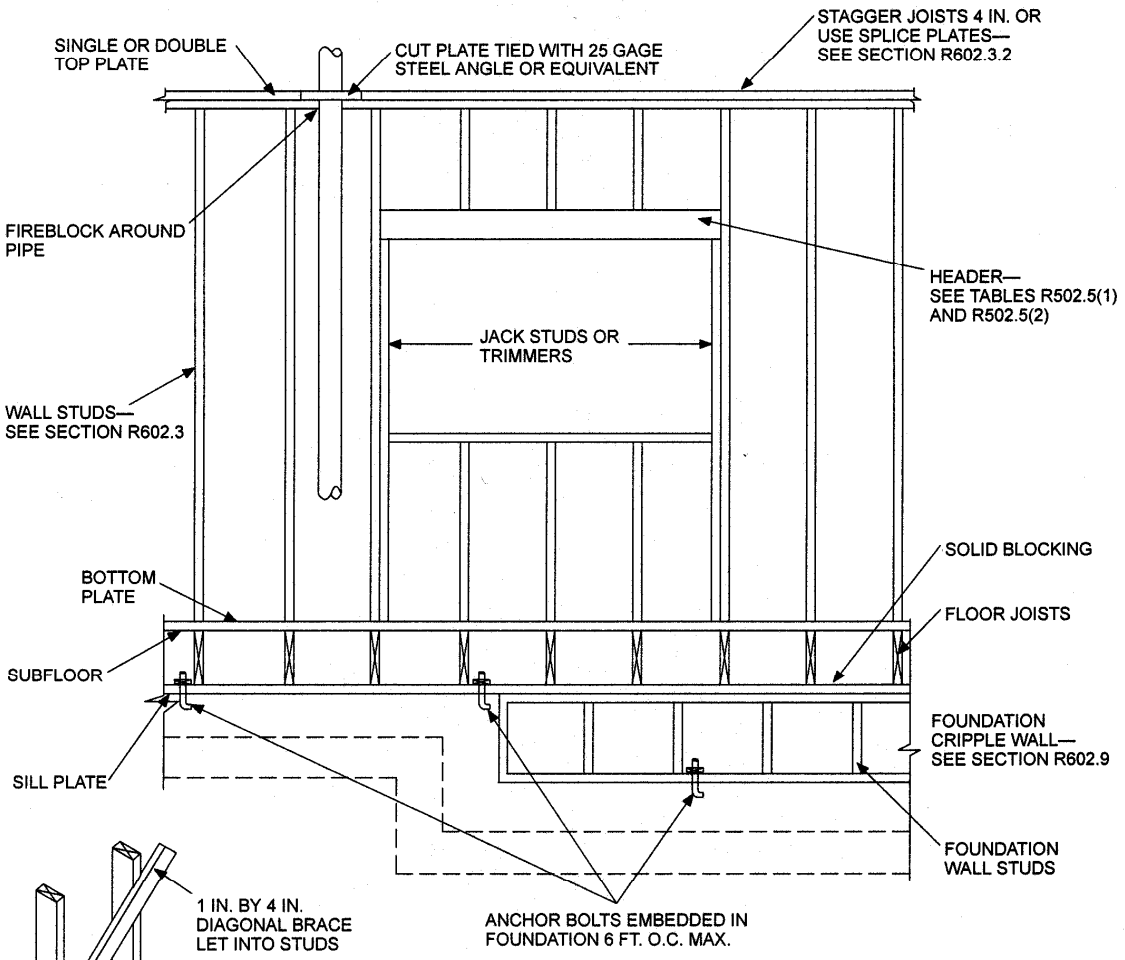
b. Shall not be used in exterior walls.

c. A habitable attic assembly supported by 2 × 4 studs is limited to a roof span of 32 feet. Where the roof span exceeds 32 feet, the wall studs shall be increased to 2 × 6 or the studs shall be designed in accordance with accepted engineering practice.

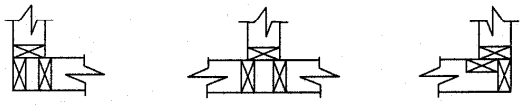

RAFTERS AND CEILING JOISTS OR APPROVED ROOF TRUSS
TOP PLATE
TOP PLATE— SEE DRILLING AND NOTCHING PROVISIONS SECTION R602.6.1
SECOND STORY
WALL STUD— SEE DRILLING AND NOTCHING PROVISIONS SECTION R606.6
JOIST IS PERMITTED TO BE CUT OR NOTCHED BETWEEN THESE LIMITS
FLOOR JOIST— SEE DRILLING AND NOTCHING PROVISIONS SECTION R502.6
1/3 SPAN
1/3 SPAN
BOTTOM PLATE
TOP PLATE
JOIST NAILED TO STUD
BAND JOIST OR BLOCKING
FOR BLOCKING AND BRIDGING—SEE SECTION R502.5
1 IN. × 4 IN. RIBBON CUT INTO STUD— SEE SECTION R602.7 FOR FIRE BLOCKING
BEARING WALL
LAP JOIST 3 IN. MIN. OR SPLICE—SEE SECTION R502.4.1
BAND JOIST OR BLOCKING
BOTTOM PLATE
SILL PLATE
JOIST
SUBFLOOR
CRAWL SPACE OR BASEMENT FOUNDATION
MONOLITHIC SLAB-ON-GRADE FOUNDATION
INTERMEDIATE BEARING WALL
PLATFORM FRAMING
BALLOON FRAMING

For SI: 1 inch = 25.4 mm.

FIGURE R602.3(1)
TYPICAL WALL, FLOOR AND ROOF FRAMING


SINGLE OR DOUBLE TOP PLATE
CUT PLATE TIED WITH 25 GAGE STEEL ANGLE OR EQUIVALENT
STAGGER JOISTS 4 IN. OR USE SPLICE PLATES— SEE SECTION R602.3.2
FIREBLOCK AROUND PIPE
HEADER— SEE TABLES R502.5(1) AND R502.5(2)
JACK STUDS OR TRIMMERS
WALL STUDS— SEE SECTION R602.3
SOLID BLOCKING
BOTTOM PLATE
FLOOR JOISTS
SUBFLOOR
FOUNDATION CRIPPLE WALL— SEE SECTION R602.9
SILL PLATE
FOUNDATION WALL STUDS
1 IN. BY 4 IN. DIAGONAL BRACE LET INTO STUDS
ANCHOR BOLTS EMBEDDED IN FOUNDATION 6 FT. O.C. MAX.

CORNER AND PARTITION POSTS

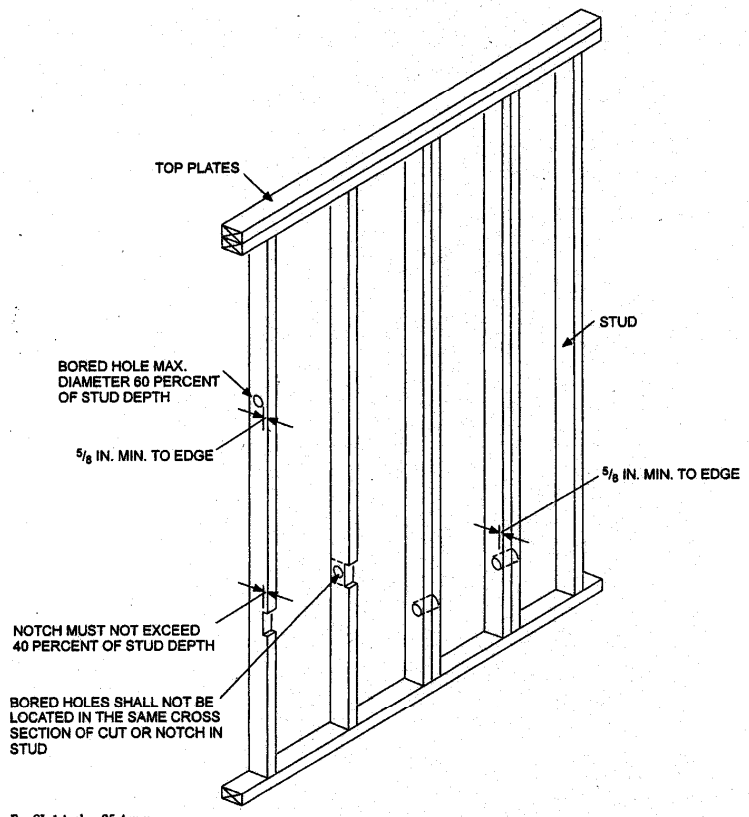


APPLY APPROVED SHEATHING OR BRACE EXTERIOR WALLS WITH 1 IN. BY 4 IN. BRACES LET INTO STUDS AND PLATES AND EXTENDING FROM BOTTOM PLATE TO TOP PLATE, OR OTHER APPROVED METAL STRAP DEVICES INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. SEE SECTION R602.10.

Note: A third stud and/or partition intersection backing studs shall be permitted to be omitted through the use of wood backup cleats, metal drywall clips or other approved devices that will serve as adequate backing for the facing materials.

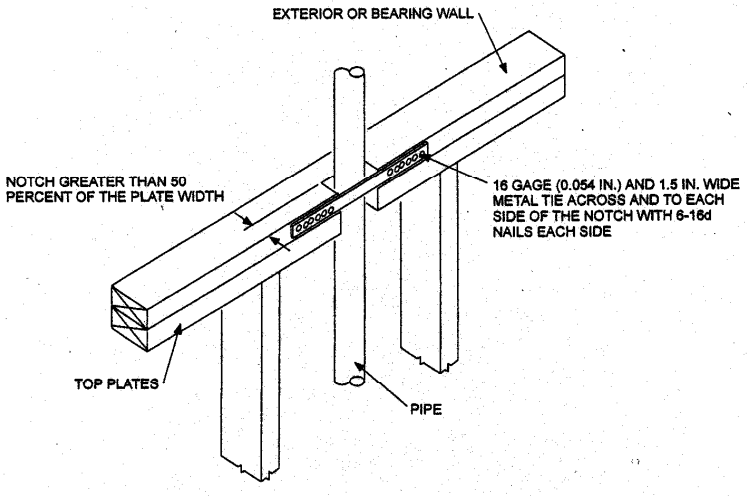
For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

FIGURE R602.3(2)
FRAMING DETAILS


TOP PLATES
STUD
BORED HOLE MAX. DIAMETER 60 PERCENT OF STUD DEPTH
5/8 IN. MIN. TO EDGE
5/8 IN. MIN. TO EDGE
NOTCH MUST NOT EXCEED 40 PERCENT OF STUD DEPTH
BORED HOLES SHALL NOT BE LOCATED IN THE SAME CROSS SECTION OF CUT OR NOTCH IN STUD

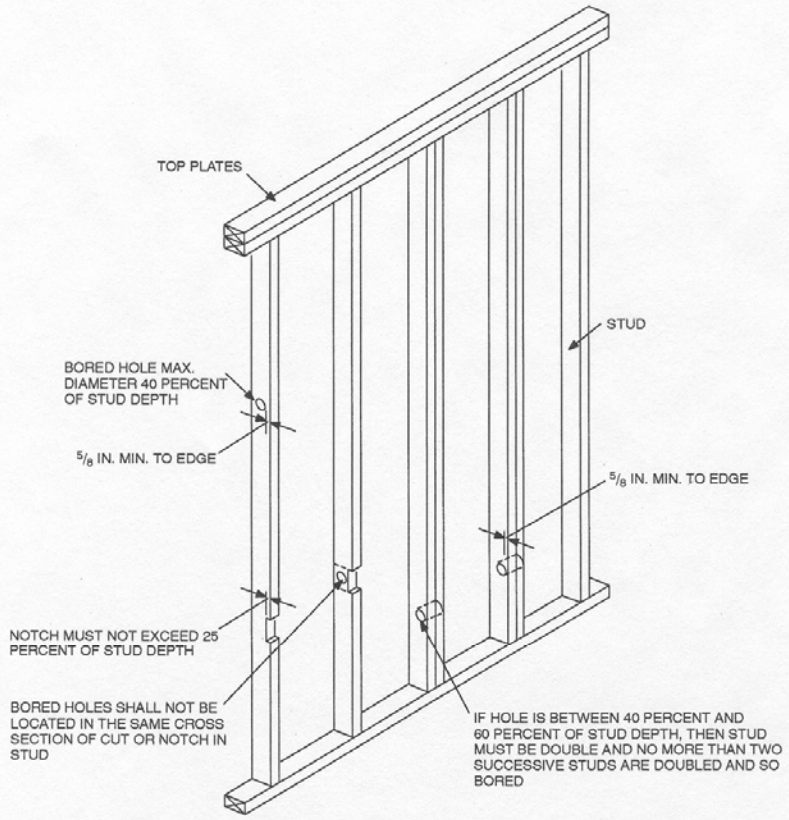
For SI: 1 inch = 25.4 mm.

FIGURE R602.6(2)
NOTCHING AND BORED HOLE LIMITATIONS FOR INTERIOR NONBEARING WALLS


EXTERIOR OR BEARING WALL
NOTCH GREATER THAN 50 PERCENT OF THE PLATE WIDTH
16 GAGE (0.054 IN.) AND 1.5 IN. WIDE METAL TIE ACROSS AND TO EACH SIDE OF THE NOTCH WITH 6-16d NAILS EACH SIDE
TOP PLATES
PIPE

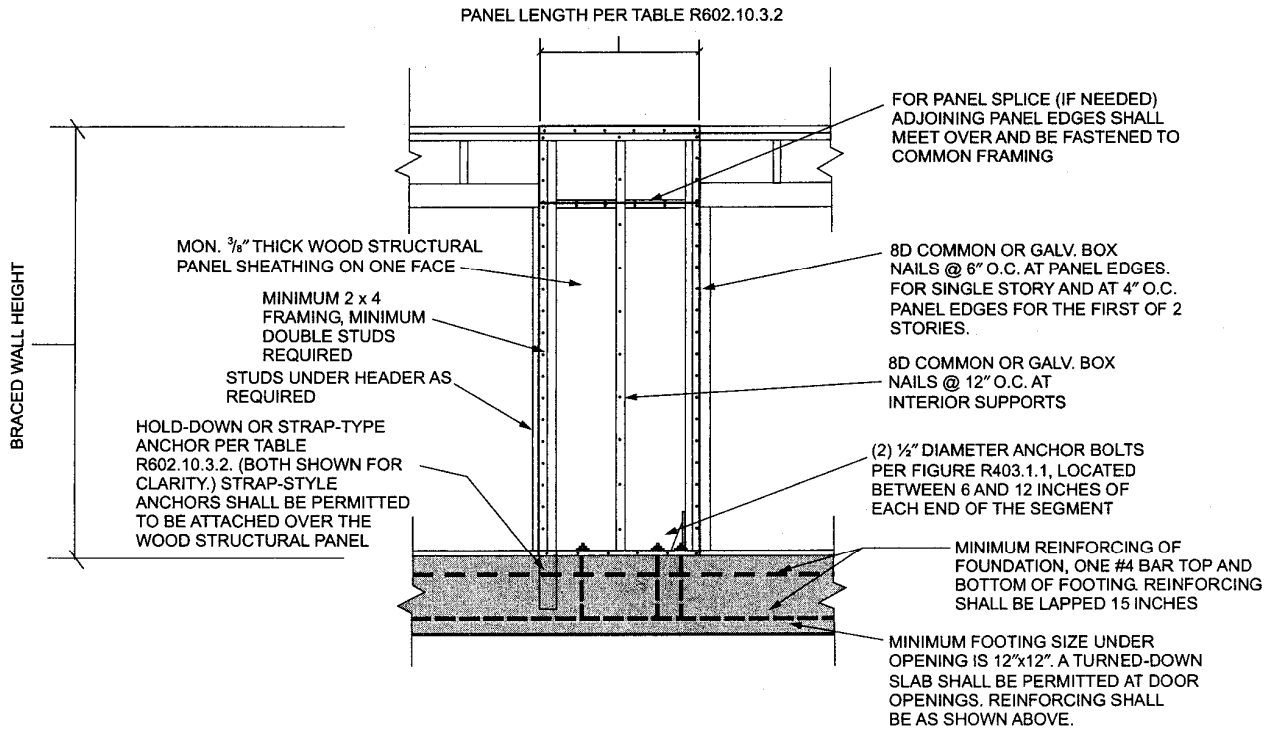
For SI: 1 inch = 25.4 mm.

FIGURE R602.6.1
TOP PLATE FRAMING TO ACCOMMODATE PIPING


TOP PLATES
STUD
BORED HOLE MAX. DIAMETER 40 PERCENT OF STUD DEPTH
5/8 IN. MIN. TO EDGE
5/8 IN. MIN. TO EDGE
NOTCH MUST NOT EXCEED 25 PERCENT OF STUD DEPTH
BORED HOLES SHALL NOT BE LOCATED IN THE SAME CROSS SECTION OF CUT OR NOTCH IN STUD
IF HOLE IS BETWEEN 40 PERCENT AND 60 PERCENT OF STUD DEPTH, THEN STUD MUST BE DOUBLE AND NO MORE THAN TWO SUCCESSIVE STUDS ARE DOUBLED AND SO BORED

For SI: 1 inch = 25.4 mm.
NOTE: Condition for exterior and bearing walls.

FIGURE R602.6(1)
NOTCHING AND BORED HOLE LIMITATIONS FOR EXTERIOR WALLS AND BEARING WALLS


PANEL LENGTH PER TABLE R602.10.3.2
BRACED WALL HEIGHT
FOR PANEL SPLICE (IF NEEDED) ADJOINING PANEL EDGES SHALL MEET OVER AND BE FASTENED TO COMMON FRAMING
MON. 3/8" THICK WOOD STRUCTURAL PANEL SHEATHING ON ONE FACE
8D COMMON OR GALV. BOX NAILS @ 6" O.C. AT PANEL EDGES. FOR SINGLE STORY AND AT 4" O.C. PANEL EDGES FOR THE FIRST OF 2 STORIES.
MINIMUM 2 x 4 FRAMING, MINIMUM DOUBLE STUDS REQUIRED
STUDS UNDER HEADER AS REQUIRED
8D COMMON OR GALV. BOX NAILS @ 12" O.C. AT INTERIOR SUPPORTS
HOLD-DOWN OR STRAP-TYPE ANCHOR PER TABLE R602.10.3.2. (BOTH SHOWN FOR CLARITY.) STRAP-STYLE ANCHORS SHALL BE PERMITTED TO BE ATTACHED OVER THE WOOD STRUCTURAL PANEL
(2) 1/2" DIAMETER ANCHOR BOLTS PER FIGURE R403.1.1, LOCATED BETWEEN 6 AND 12 INCHES OF EACH END OF THE SEGMENT
MINIMUM REINFORCING OF FOUNDATION, ONE #4 BAR TOP AND BOTTOM OF FOOTING. REINFORCING SHALL BE LAPPED 15 INCHES
MINIMUM FOOTING SIZE UNDER OPENING IS 12"x12". A TURNED-DOWN SLAB SHALL BE PERMITTED AT DOOR OPENINGS. REINFORCING SHALL BE AS SHOWN ABOVE.

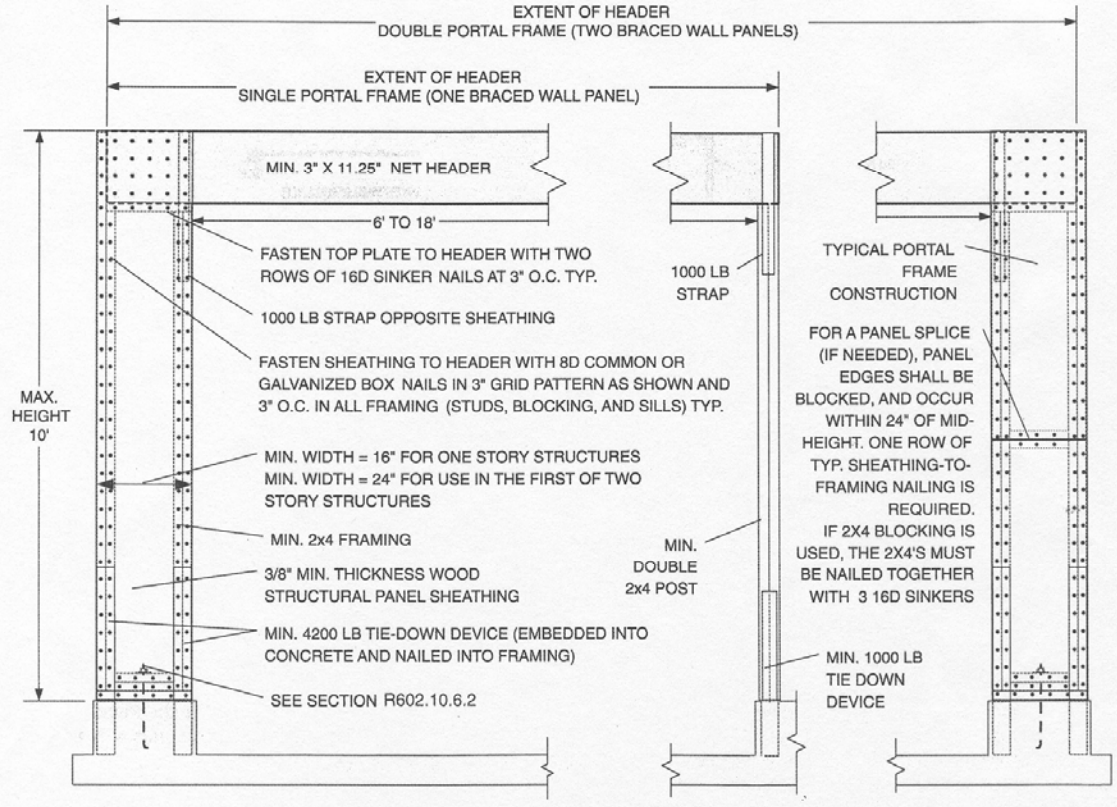
or SI: 1 inch = 25.4 mm.

FIGURE R602.10.3.2
ALTERNATE BRACED WALL PANEL

TABLE R602.10.6
MINIMUM WIDTHS AND TIE-DOWN FORCES OF ALTERNATE BRACED WALL PANELS

SEISMIC DESIGN CATEGORY AND WINDSPEED	TIE-DOWN FORCE (lb)	HEIGHT OF BRACED WALL PANEL				
		Sheathed Width				
		8 ft. 2′ - 4″	9 ft. 2′ - 8″	10 ft. 2′ - 8″	11 ft. 3′ - 2″	12 ft. 3′ - 6″
SDC A, B, and C Windspeed < 110 mph	R602.10.6.1, Item 1	1800	1800	1800	2000	2200
	R602.10.6.1, Item 2	3000	3000	3000	3300	3600
		Sheathed Width				
SDC D_0, D_1 and D_2 Windspeed < 110 mph		2′ - 8″	2′ - 8″	2′ - 8″	Note a	Note a
	R602.10.6.1, Item 1	1800	1800	1800	—	—
	R602.10.6.1, Item 2	3000	3000	3000	—	—

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.
a. Not permitted because maximum height is 10 feet.


EXTENT OF HEADER
DOUBLE PORTAL FRAME (TWO BRACED WALL PANELS)
EXTENT OF HEADER
SINGLE PORTAL FRAME (ONE BRACED WALL PANEL)
MIN. 3" X 11.25" NET HEADER
6' TO 18'
FASTEN TOP PLATE TO HEADER WITH TWO ROWS OF 16D SINKER NAILS AT 3" O.C. TYP.
1000 LB STRAP OPPOSITE SHEATHING
FASTEN SHEATHING TO HEADER WITH 8D COMMON OR GALVANIZED BOX NAILS IN 3" GRID PATTERN AS SHOWN AND 3" O.C. IN ALL FRAMING (STUDS, BLOCKING, AND SILLS) TYP.
MAX. HEIGHT 10'
MIN. WIDTH = 16" FOR ONE STORY STRUCTURES
MIN. WIDTH = 24" FOR USE IN THE FIRST OF TWO STORY STRUCTURES
MIN. 2x4 FRAMING
3/8" MIN. THICKNESS WOOD STRUCTURAL PANEL SHEATHING
MIN. 4200 LB TIE-DOWN DEVICE (EMBEDDED INTO CONCRETE AND NAILED INTO FRAMING)
SEE SECTION R602.10.6.2
1000 LB STRAP
MIN. DOUBLE 2x4 POST
TYPICAL PORTAL FRAME CONSTRUCTION
FOR A PANEL SPLICE (IF NEEDED), PANEL EDGES SHALL BE BLOCKED, AND OCCUR WITHIN 24" OF MID-HEIGHT. ONE ROW OF TYP. SHEATHING-TO-FRAMING NAILING IS REQUIRED. IF 2X4 BLOCKING IS USED, THE 2X4'S MUST BE NAILED TOGETHER WITH 3 16D SINKERS
MIN. 1000 LB TIE DOWN DEVICE

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound = 0.454 kg.

FIGURE R602.10.6.2
ALTERNATE BRACED WALL PANEL ADJACENT TO A DOOR OR WINDOW OPENING

TABLE R703.4
WEATHER-RESISTANT SIDING ATTACHMENT AND MINIMUM THICKNESS

SIDING MATERIAL		NOMINAL THICKNESS[a] (inches)	JOINT TREATMENT	SHEATHING PAPER REQUIRED	TYPE OF SUPPORTS FOR THE SIDING MATERIAL AND FASTENERS[b,c,d]				
					Wood or wood structural panel sheathing	Fiberboard sheathing into stud	Gypsum sheathing into stud	Direct to studs	Number or spacing of fasteners
Horizontal aluminum[e]	Without insulation	0.019[f]	Lap	No	0.120 nail $1\frac{1}{2}$″ long	0.120 nail 2″ long	0.120 nail 2″ long	Not allowed	Same as stud spacing
		0.024	Lap	No	0.120 nail $1\frac{1}{2}$″ long	0.120 nail 2″ long	0.120 nail 2″ long	Not allowed	
	With insulation	0.019	Lap	No	0.120 nail $1\frac{1}{2}$″ long	0.120 nail $2\frac{1}{2}$″ long	0.120 nail $2\frac{1}{2}$″ long	0.120 nail $1\frac{1}{2}$″ long	
Brick veneer Concrete masonry veneer		2 2	Section R703	Yes Note m	See Section R703 and Figure R703.7[h]				
Hardboard[l] Panel siding-vertical		$\frac{7}{16}$	Note r	Note r	Note o	Note o	Note o	Note o	6″ panel edges 12″ inter. sup.[p]
Hardboard[l] Siding vertical Lap-siding-horizontal		$\frac{7}{16}$ $\frac{7}{16}$	Note g Note r	Note g Note r	Note q	Note q	Note q	Note q	Same as stud spacing 2 per bearing
Steel[i]		29 ga.	Lap	No	0.113 nail $1\frac{3}{4}$″ Staple-$1\frac{3}{4}$″	0.113 nail $2\frac{3}{4}$″ Staple-$2\frac{1}{2}$″	0.113 nail $2\frac{1}{2}$″ Staple-$2\frac{1}{4}$″	Not allowed	Same as stud spacing
Stone veneer		2	Section R703	Yes	See Section R703 and Figure R703.7				
Particleboard panels		$\frac{3}{8}$ - $\frac{1}{2}$	Note g	Note g	6d box nail	6d box nail	6d box nail	6d box nail, $\frac{3}{8}$ not allowed	6″ panel edges 12″ inter. sup.
		$\frac{5}{8}$	Note g	Note g	6d box nail	8d box nail	8d box nail	6d box nail	
Plywood panel[j] (exterior grade)		$\frac{3}{8}$	Note g	Note g	0.099 nail-2″	0.113 nail-$2\frac{1}{2}$″	0.099 nail-2″	0.099 nail-2″	6″ on edges
Vinyl Siding[n]		0.035	Lap	No	0.120 nail $1\frac{1}{2}$″ Staple-$1\frac{3}{4}$″	0.120 nail 2″ Staple-$2\frac{1}{2}$″	0.120 nail 2″ Staple-$2\frac{1}{2}$″	Not allowed	Same as stud spacing
Wood[k] Rustic, drop		$\frac{3}{8}$ Min	Lap	No	Fastener penetration into stud-1″			0.113 nail-$2\frac{1}{2}$″ Staple-2″	Face nailing up to 6″ widths, 1 nail per bearing; 8″ widths and over, 2 nails per bearing
Shiplap		$\frac{19}{32}$ Average	Lap	No					
Bevel		$\frac{7}{16}$							
Butt tip		$\frac{3}{16}$	Lap	No					

For SI: 1 inch = 25.4 mm.

a. Based on stud spacing of 16 inches on center Where studs are spaced 24 inches, siding shall be applied to sheathing approved for that spacing.

b. Nail is a general description and shall be T-head, modified round head, or round head with smooth or deformed shanks.

c. Staples shall have a minimum crown width of $\frac{7}{16}$-inch outside diameter and be manufactured of minimum No. 16 gage wire.

d. Nails or staples shall be aluminum, galvanized, or rust-preventive coated and shall be driven into the studs for fiberboard or gypsum backing.

e. Aluminum nails shall be used to attach aluminum siding.

f. Aluminum (0.019 inch) shall be unbacked only when the maximum panel width is 10 inches and the maximum flat area is 8 inches. The tolerance for aluminum siding shall be +0.002 inch of the nominal dimension.

g. If boards or panels are applied over sheathing or a weather-resistant membrane, joints need not be treated. Otherwise, vertical joints shall occur at studs and be covered with battens or be lapped.

h. All attachments shall be coated with a corrosion-resistive coating.

i. Shall be of approved type.

j. Three-eighths-inch plywood shall not be applied directly to studs spaced greater than 16 inches on center when long dimension is parallel to studs. One-half-inch plywood shall not may be applied directly to studs spaced greater than 24 inches on center. The stud spacing shall not exceed the panel span rating provided by the manufacturer unless the panels are installed with the face grain perpendicular to studs or over sheathing approved for that stud spacing.

(continued)

Footnotes to Table R703.4—continued

i. Three-eighths-inch plywood shall not be applied directly to studs spaced more than 16 inches on center when long dimension is parallel to studs. Plywood $^1/_2$-inch or thinner shall not be applied directly to studs spaced more than 24 inches on center. The stud spacing shall not exceed the panel span rating provided by the manufacturer unless the panels are installed with the face grain perpendicular to the studs or over sheathing approved for that stud spacing.
j. Wood board sidings applied vertically shall be nailed to horizontal nailing strips or blocking set 24 inches on center. Nails shall penetrate $1^1/_2$ inches into studs, studs and wood sheathing combined, or blocking. A weather-resistive membrane shall be installed weatherboard fashion under the vertical siding unless the siding boards are lapped or battens are used.
k. Hardboard siding shall comply with AHA A135.6.
l. For masonry veneer, a weather-resistive sheathing paper is not required over a sheathing that performs as a weather-resistive barrier when a 1-inch air space is provided between the veneer and the sheathing. When the 1-inch space is filled with mortar, a weather-resistive sheathing paper is required over studs or sheathing.
m. Vinyl siding shall comply with ASTM D 3679.
n. Minimum shank diameter of 0.092 inch, minimum head diameter of 0.225 inch, and nail length must accommodate sheathing and penetrate framing $1^1/_2$ inches.
o. When used to resist shear forces, the spacing must be 4 inches at panel edges and 8 inches on interior supports.
p. Minimum shank diameter of 0.099 inch, minimum head diameter of 0.240 inch, and nail length must accommodate sheathing and penetrate framing $1^1/_2$ inches.
q. Vertical end joints shall occur at studs and shall be covered with a joint cover or shall be caulked.
r. Fiber cement siding shall comply with the requirements of ASTM C 1186.
s. See Section R703.10.1.
t. Minimum 0.102″ smooth shank, 0.255″ round head.
u. Minimum 0.099″ smooth shank, 0.250″ round head.
v. See Section R703.10.2.
w. Face nailing: 2 nails at each stud. Concealed nailing: one 11 gage $1^1/_2$ galv. roofing nail (0.371″ head diameter, 0.120″ shank) or 6d galv. box nail at each stud.
x. See Section R703.2 exceptions.
y. Minimum nail length must accommodate sheathing and penetrate framing $1^1/_2$ inches.
z. Adhered masonry veneer shall comply with the requirements in Sections 6.1 and 6.3 of ACI 530/ASCE 5/TMS-402.

TABLE R703.5.2
MAXIMUM WEATHER EXPOSURE FOR WOOD SHAKES AND SHINGLES ON EXTERIOR WALLS[a,b,c]
(Dimensions are in inches)

LENGTH	EXPOSURE FOR SINGLE COURSE	EXPOSURE FOR DOUBLE COURSE
Shingles[a]		
16	$7^1/_2$	12[b]
18	$8^1/_2$	14[c]
24	$11^1/_2$	16
Shakes[a]		
18	$8^1/_2$	14
24	$11^1/_2$	18

For SI: 1 inch = 25.4 mm.
a. Dimensions given are for No. 1 grade.
b. A maximum 10-inch exposure is permitted for No. 2 grade.
c. A maximum 11-inch exposure is permitted for No. 2 grade.